

A CATALOGUE OF INTRODUCED SNAILS AND SLUGS IN AUSTRALIA

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Plate xxiv.

THIS paper is a record of land and freshwater molluses introduced into Australia. Its main object is to stimulate interest in the collecting and identifying of introduced species.

Following a request from Dr. H. E. Quiek, President of the Malacological Society of London, for land snails, the author collected many living specimens in South Australia and western Victoria. Series of these were sent to Dr. Quiek for comparison with authentic material from type localities in overseas museums and for dissection, and he gives a brief review of the introduced land molluses in the references cited. Identification is difficult, and a thorough anatomical study of the animal as well as a microscopic examination of the shell is required before any satisfactory conclusions can be reached. An exchange of authentic material has aided this work in South Australia. Introduced snails frequently show variation from the typical species.

The Common Garden Snail *Helix aspersa* is abundant in South Australia and variations in shell form and animal colouring occur. In later years there appears to be a greater percentage of pale pigmented specimens, some approaching the albino *exalbida*, odd specimens of which have been taken. Shells from the foothills are thinner and smaller of the *tenuior* variety, while some in the Torrens Valley area approach dark *nigrescens*. The largest specimens taken are from Kangaroo Island. Two sinistral specimens, one *cornucopia* and one *acuminata*, are in the Museum collection, taken locally. Soil, rainfall, temperature, period of colonization, original variety and other factors have been mentioned in connection with some of these variants, but no scientific investigation has been made locally.

Further species of land molluses and, in addition, the freshwater species are recorded here as a preliminary basis for Australian workers. Numerous requests for identification of introduced species are made by government bodies to the agricultural departments, museums and universities, and it is presumed that similar questions are submitted to institutions in other States.

SLUGS.

MILAX GAGATES (Draparnaud) 1801.

Distribution. South Western Europe, Greece, Izium, North Africa, Atlantic Isles, British Isles.

Introduced. South Africa, Bermuda, Juan Fernandez, North and South America, New Zealand.

Australia. S.A., Viet., N.S.W.

Remarks. Jet Slug. Small Black Slug. Redescribed as *Limax maurus* Quoy and Gaimard 1824 from Port Jackson, *Milax tasmanicus* Tate 1880 from Tasmania, *Limax pectinatus* Selenka 1865, Sydney.

Time. Pleistocene to Recent. England.

LIMAX MAXIMUS Linne 1758.

Distribution. Europe to North Bergen, Transeaucasia, Baviois, Algiers, Atlantic Isles, British Isles.

Introduced. North America, South Africa, North and South America, New Zealand.

Australia. S.A., N.S.W., Viet., Tas.

Time. Pleistocene to Recent. England.

Remarks. Great Grey Slug.

LIMAX FLAVUS Linne 1758.

Distribution. Europe, Norway, Syria, Tripoli, Atlantic Isles, British Isles.

Introduced. North and South America, Japan, South Africa, New Zealand.

Australia. S.A., N.S.W., Viet., Tas., Q.

Time. Pleistocene, Cromerian to Recent. England.

Remarks. Yellow slug. Redescribed as *Limax megalodontes* Quoy and Gaimard 1824 from Port Jackson, *Limax olivaceus* Gould 1852 from Parramatta, and possibly *Limax bicolor* Selenka 1865 from Sydney.

LIMAX MARGINATUS Müller 1774.

Distribution. Europe, Greece to Finland and Eastern Russia, Iceland, British Isles.

Introduced. North America, New Zealand.

Australia. S.A.

Time. Pleistocene, Cromerian to Recent. England.

Remarks. Tree Slug. Sometimes referred to as *Limax* (*Lehmannia*) *arborum* Bouchard-Chantereaux 1837.

AGRIOLIMAX AGRESTIS (Linne) 1758.

Distribution. Northern Europe, Asia, Turkestan, China, Japan, North Africa, Syria, Atlantic Isles, Greenland, British Isles.

Introduced. Zanzibar, North and South America, South Africa, West Indies, Mauritius, New Zealand.

Australia. S.A., N.S.W., Vict., Tas.

Time. Pleistocene to Recent. England.

Remarks. Field slug. Redescribed as *Limax legrandi* Tate, Tasmania and *Limax molestia* Hutton, New Zealand.

AGRIOLIMAX LAEVIS (Müller) 1774.

Distribution. Europe, Northern Asia, North and Central America, British Isles.

Introduced. South America, West Indies, South Africa, Madagascar.

Australia. S.A., Q.

Time. Pleistocene to Recent. England.

Remarks. Marsh Slug. Smooth Slug. Recorded from the foothills of the Mount Lofty Ranges, near Adelaide. A synonym is *Limax queenslandicus* Hedley 1888.

AGRIOLIMAX RETICULATUS (Müller) 1774.

Distribution. Southern Europe, Asia, North Africa, Atlantic Isles, British Isles.

Introduced. North and South America, South Africa, New Zealand.

Australia. Viet., N.S.W., Tas.

Time. Pleistocene to Recent. England.

Remarks. Netted Field Slug.

ARION HORTENSIS Férussac 1819.

Distribution. Central Europe, northwards to Tromsø, North Spain, France, Italy, Netherlands, Russia, British Isles.

Introduced. North America, South Africa, New Zealand.

Australia. S.A.

Remarks. Garden Slug. The South Australian record is not definitely confirmed.

ARION ATER (Linne) 1758.

Distribution. Europe, Portugal, Italy, Balkans, British Isles.

Introduced. North America, New Zealand.

Australia. S.A., N.S.W., Viet.

Remarks. Large Black Slug.

TESTACELLA HALIOTIDEA Draparnaud 1801.

Distribution. North Africa, Western Europe, Belgium, Germany, Balearic Isles, Canary Isles, Madeira, British Isles.

Introduced. North America.

Australia. S.A., Tas., N.S.W.

Time. Holocene to Recent. England.

Remarks. Shelled Slug. Carnivorous Slug. Recorded from the Botanical Gardens, Adelaide. *Testacella maugei* Férussac 1819. Is a synonym.

SNAILS.

EUPARYPHA PISANA (Müller) 1774.

Distribution. Europe, Mediterranean, North Africa, Atlantic Isles, British Isles.

Introduced. North America, South Africa.

Time. Pleistocene to Recent. England.

Australia. Cottesloe, W.A., Viet., Geelong, N.S.W.

Remarks. White Snail. Now placed in the genus *Theba*. Specimens closely resembling this species and similar to those taken at Cottesloe, Western Australia, were found alive by H. M. Cooper on April 22nd, 1954, at Port Arthur, near Port Wakefield, S.A., on Boxthorn, about 200 yards above the high tide level.

HELICELLA ITALA (Linne) 1758.

Distribution. Europe to Petrograd, Transcaucasia, Algeria and Syria, British Isles.

Introduced. New Zealand.

Australia. S.A.

Time. Lower Pleistocene to Recent. England.

Remarks. Heath Snail. South-east of South Australia. Mentioned as introduced to South Australia by A. E. Ellis, "British Snails," 1926, p. 195. Originally recorded as *Helicella ericetorum* (Müller) 1821. Dr. Quick now identifies specimens from Yorke Peninsula as *Helicella (Xerocincta) neglecta*, mentioned below.

HELICELLA (XEROCINCTA) NEGLECTA (Draparnaud) 1805.

Distribution. Southern France, Italy, Germany, Greece, Syria, Algeria.

Introduced. British Isles.

Australia. S.A., Yorke Peninsula.

Time. Recent. England.

Remarks. White Heath Snail.

HELICELLA (CERNUELLA) VIRGATA (Da Costa) 1779.

Distribution. Western Europe, Mediterranean east to Crimea, British Isles.

Introduced. Australia.

Australia. S.A. "N.W.A. Foul Point" (Richardson, quoted by Musson), N.S.W., Viet.

Time. Pleistocene to Recent. England.

Remarks. Striped Snail. Recorded from vineyards at Northfield near Adelaide, South Australia. Dr. Quiek identifies the S.A. records of *Theba pisana* as belonging to *H. virgata*, a synonym of which is *H. variabilis* Draparnaud, mentioning that "It is true the shell of the Northfield examples is more globose and the upper surface of the whorls flatter than in the British variety of this variable shell that I have seen, and the umbilicus is smaller than the typical."

Shells sent from Kangaroo Island are identified by him as *H. virgata depressa* Requien 1868, or *H. v. subaperta* Jeffreys. *H. virgata depressa* Requien 1848 was taken in 1953 at American River, Kangaroo Island.

HELICELLA (CANDIDULA) CAPERATA (Montagn) 1803.

Distribution. Europe to Crimea, Bagdad, British Isles.

Introduction. Australia.

Australia. S.A., Robe, Viet., Tas.

Time. Pleistocene to Recent. England.

Remarks. Wrinkled Snail.

HELICELLA (MICROSCEROMAGNA) STOLISMENA (Bourguignat) 1880.

Distribution. Spain, France.

Introduced. Australia.

Australia. S.A., South-east.

Remarks. A species named and described as *Helicella mayeri* Gude 1914 was taken on "Tea Tree" *Melaleuca*, at Millicent, South Australia. Dr. Quiek thinks that the species may be *H. stolismena*. Living specimens are required to verify the identification. Although numerous shells are in the Museum collection from Millicent and Robe, no living specimens have been obtained in recent years. A synonym of *H. stolismena* is *Helix vestita* Rambur 1868 preoccupied by Ferrasac 1819.

HELICELLA HERIPENSIS (Mabille) 1877.

Distribution. Germany, France, British Isles.

Introduced. Australia.

Time. Pleistocene to Recent. England.

Australia. S.A., Adelaide foothills and S.E. S.A.

Remarks. Hedge Snail. Originally introduced into the South-east but now taken in the foothills of the Mount Lofty Ranges, near Adelaide, in gardens. Also called *Candidula gigaxii* (Charpentier) 1850. These may be *H. caperata*, the identification needs confirming.

COCHLICELLA ACUTA (Müller) 1774.

Distribution. South-western Europe, Mediterranean, British Isles.

Introduced. Australia.

Time. Pleistocene to Recent. England.

Australia. S.A., Yorke Peninsula, W.A., Cottesloe, Viet.

Remarks. Pointed Snail. Common at Stansbury and Minlaton, Yorke Peninsula, S.A., and Cottesloe, W.A. *Bulimus acutus* Müller 1774 is an older name for this species. Listed by Cox and Hedley, 10, p. 10, as *Helicella arborea* Linne 1889 from Victoria.

COCHLICELLA VENTROSA (Férussac) 1819.

Distribution. Mediterranean, Canaries, Azores, Bermuda.

Introduced. South Africa.

Australia. S.A., Yorke Peninsula, Mount Gambier, Adelaide; Viet., N.S.W., W.A.

Time. Recent.

Remarks. Swollen Snail. Recorded from Corny Point and the South-east of South Australia. Sometimes referred to as *C. ventricosa* (Draparnand) 1831, pre-occupied. There are two variants in Adelaide gardens, *C. bizona* Moquin-Tandon and *C. inflata* Moquin-Tandon.

HELIX ASPERSA Müller 1774.

Distribution. Netherlands, France, Spain, Mediterranean, British Isles.

Introduced. North and South America, South Africa, New Zealand.

Australia. S.A., Viet., N.S.W., W.A.

Time. Pleistocene to Recent. England.

Remarks. Garden Snail. Common in gardens, general. Brightly coloured specimens with thick shells measuring 36 mm. in diameter are numerous at Muston, Kangaroo Island, according to a series taken by H. M. Cooper in February, 1954.

OXYCHILUS CELLARIA (Müller) 1774.

Distribution. Europe, Algeria, Rhodes, Armenia, Palestine, Persia, British Isles.

Introduced. North and South America, South Africa, New Zealand.

Australia. N.S.W., Viet., Tas.

Time. Pleistocene to Recent. England.

Remarks. Cellar Snail. Redescribed as *Helix sydneyensis* Cox, from N.S.W. Sometimes called *Helicella* and *Vitrea cellaria*. Actively carnivorous in Sydney gardens. Eats slaters and *Helix aspersa*.

OXYCHILUS ALLIARIUS (Miller) 1822.

Distribution. Europe, Algeria.

Introduced. America, South Africa, New Zealand.

Australia. N.S.W.

Time. Pleistocene to Recent. England.

Remarks. Mentioned by Ellis 1926, "British Snails," p. 244, as having been introduced into Australia and first recorded from Australia by J. S. Miller, 1822.

GEOSTILBIA APERTA (Swainson) 1835.

Distribution. Southern Europe.

Introduced. Australia.

Australia. Tas.

Remarks. Recorded from Australia by Petterd and Hedley, 1909.

VITREA CRYSTALLINA (Müller) 1774.

Distribution. Europe, north to Hamar Stift and east to the Caucasus, Algeria, Atlantic Isles, British Isles.

Introduced. Australia.

Australia. Tas.

Time. Pleistocene to Recent. England.

Remarks. Crystal Snail. *Vitrina* may prefer a carnivorous diet.

ZONITOIDES NITIDA (Müller) 1774.

Distribution. Europe, Algeria, Asia, Kashmir, Tibet, Japan, North America, British Isles.

Introduced. South America, New Zealand.

Australia. N.S.W., Tas., Viet.

Time. Pleistocene, Cromerian to Recent. England.

Remarks. Shiny Snail.

VALLONIA COSTATA (Müller) 1774.

Distribution. British Isles. Europe, North America.

Introduced. Madeira. Azores, South Africa, Palestine.

Australia. N.S.W., Tas., Norfolk Island.

Time. Pleistocene to Recent. England.

Remarks. Ribbed Snail. Known also as *Helix pulchella* Müller 1805, and redescribed as *Helix alexandrae* Cox 1868, from places about Sydney.

VALLONIA PULCHELLA (Müller) 1774.

Distribution. British Isles.

Introduced. South Africa.

Australia. N.S.W., Tas., Norfolk Island.

Time. Pliocene to Recent. England.

Remarks. Beautiful Snail.

SUBULINA OCTANA (Bruguière) 1780.

Distribution. America.

Introduced. England.

Australia. N.S.W.

FERUSSACIA FOLLICULUS (Gronovius) 1781.

Distribution. Mediterranean, South of France from the Pyrénées to the Riviera and in the Balearic Isles.

Australia. S.A., Linden Park, suburb of Adelaide.

Remarks. Inflated Ferussacia. This small snail was seen in great numbers on August 1, 1953, at Verdale Avenue, Linden Park, a suburb of Adelaide, by Colin F. Hutchinson. Groups of individuals were found in very damp places on a building block, under bricks, old cement bags or any other type of cover. The builder, Mr. Page, noticed them only during June and July of this year (1953) and thinks they were not present when the undergrowth was burnt off in January. There are no unusual weeds among the thick grass, and the few small olive trees are seedlings of the olive tree so common in this district since the early days of white occupation. All building materials used on the block are locally produced. There is no clue as to how the snails came here. Householders and children around the district have not seen the snails even in adjacent areas. There are no records of the species or anything like it from South Australia or anywhere else in Australia. It seems that the snail has been discovered and recognized soon after importation or dispersal, and immediate steps have been taken by the Agricultural Department to eradicate it.

The shell is about a quarter of an inch long, pupaeform, brown, highly polished. The animal has a long slender foot, slender tentacles, the upper pair bearing well-developed eyes. The foot is light yellow grading to light green, anteriorly and posteriorly, and the long slender tentacles and head are a dark grey shade. The snail moved rapidly from light into shade, and one would say, from its general appearances and habits, that it would not survive the heat and dryness of the Adelaide Plains. It would probably thrive in hot houses whence these specimens may have originated. It is prolific and ovoviparous, the young being formed in an egg and the egg hatched inside the parent. It is normally herbivorous, but is said to turn carnivorous when vegetable food is unobtainable.

On first sight the species was thought to be possibly *Cochlicopa lubrica*, which is abundant all over the British Isles, Europe, North America, Asia and North Africa. Dr. Quick kindly examined specimens sent by us to the British Museum and mentioned in correspondence that it was a *Ferussacia*. The species belongs to the family Ferussaciidae, which is contained in the superfamily Achatinacea, including the family Achatinidae, and consequently has distant affinities with the Giant African Snail *Achatina fulica* Férussac, unfortunately so widely dispersed and uncontrollable. The family Ferussaciidae contains some ten genera and numerous species.

HELIX SIMILARIS Férussac 1819.

Distribution. Cuba, America, South Africa, China, Brazil, Singapore, Bengal, Mauritius, Java, Sandwich Islands.

Introduced. Frankland Isles.

Australia. N.E. Aust., N.S.W. (Sydney).

Remarks. This species appears to have been widely dispersed over the earth's surface. The Australian records are doubtful. Musson, 1890, writes, "Originally recorded for Australia from the Frankland Islands, collected by MacGillivray. Mr. Brazier, who had some of the original specimens, remarks that they are *H. aridorum*, Cox, 1867, or *Neveritis aridorum*, to give its latest name, and that it is a native snail, originally described from Clarence River, under logs in ironbark ranges, burrowing in dry weather."

OTALA VERMICULATA (Müller) 1774.

Distribution. Southern Europe and North Africa.

Introduced. Australia.

Australia. Tas.

Remarks. Recorded by Petterd and Hedley, 1909, as *Helix vermiculata* Müller 1774.

FRESHWATER SNAILS.

LYMNAEA PEREGER (Müller) 1774.

Distribution. Europe, North Africa, Asia, Kashmir, Afghanistan, Cape Verde Islands, British Isles.

Introduced. Tasmania.

Time. Pliocene to Recent. England.

Remarks. Wandering Snail. Redescribed as *Limnaea tasmanica* Tenison-Woods 1876, *Limnaea lutosa* Petterd 1889, and *Limnaea hobartensis* Tenison-Woods, 1876, from Tasmania.

LYMNAEA STAGNALIS Linne 1758.

Distribution. Europe, Asia, Afghanistan, Kashmir, North Africa, British Isles.

Introduced. Tasmania, South Australia.

Australia. Frequently seen in aquaria, but so far not established in any freshwater area.

Time. Pleistocene, Cromerian to Recent. England.

Remarks. Great Pond Snail. This snail grows very well in South Australian garden ponds and aquaria, but is not in our creeks and ponds.

PLANORBIS SPIORBIS (Linne) 1801.

Distribution. Western Europe, Asia, North Africa, British Isles.

Introduced. Australia?

Time. Pleistocene to Recent. England.

Remarks.—Button Ram's Horn. Sometimes named *Planorbis (Gyraulus) laevis*. Specimens of *P. spirorbis* Müller 1774, or more correctly *P. (Spiralina) spirorbis* Linne 1758, are labelled as Australian in the British Museum (Musson, p. 884).

PLANORBIS CAMPANULATUS Say 1821.

Distribution. North America.

Introduced. South Australia.

Remarks. Bell Planorbis. Specimens of this species were recorded by the author in the "South Australian Naturalist" 15, No. 1, p. 8, 1933, from Blanchetown, River Murray, where it was established. Mr. Oliver, Senior Resident Engineer, reported "that the shells referred to were found at approximately half a mile upstream (from Blanchetown), where the American machinery purchased

for lock construction was unloaded. This place is, however, a landing place for farm machinery and windmills of American manufacture."

This was the first record of a freshwater snail being introduced into the River Murray. I have seen no specimens at Blanchetown or elsewhere since 1933.

Petterd 4, p. 97, records that *Planorbis lacustris* is plentiful in "the freshwater streams near Melbourne." This species is probably a *Segmentina*, more recently named *Segnitila victoriae*, Smith, 1882, indigenous to the region.

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